Lab Code: 200167-0

FCC PART 25

TEST AND MEASUREMENT REPORT

For

CornerTurn, LLC

423 Jenks Circle Suite 101,

Corona, CA 92880, USA

FCC ID: YOV-MRI3000A

Report Type:	**Product Type:**
Original Report	Satellite Transceiver

Test Engineer:	Dennis Huang
Report Number:	R1008091-25
Report Date:	2010-8-30
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1008091-25	Original Report	2010-08-30

1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

The *CornerTurn LCC*, product model: MRI-3000, FCC ID: YOV-MRI3000A or the "EUT" as referred to this report is a Satellite Transceiver which is integrated with Globalstar, Inc.'s product, model: *MRI-3000*. The operating frequency is: 1610-1625 MHz for transmit and 2484-2499 MHz for receive. The *MRI-3000* features: remote access to data, transports of home area network information, and consists of a robust, water-resistant housing. It is designed to provide efficient and cost effective two-way communication data between smart meters.

1.2 Mechanical Description of EUT

The EUT measures approximately 222 mm (L) X 146 mm (W) X 84 mm (H) and weight 1.6 Kg.

The data gathered are from a production sample provided by the manufacturer, serial number: T-1001-005.

1.3 Objective

The objective is to determine continued compliance of the Satellite transmitter (FCC ID: J9CGSSDVM) integrated with model MRI-3000 in accordance with FCC Part 25 Standard's requirements for Transmitter Spurious Emission.

1.4 Related Submittal(s)/Grant(s)

Qualcomm Incorporated's report, FCC ID: J9CGSSDVM, granted on 2007-05-09.

1.5 Test Methodology

All measurements contained in this report were conducted with TIA/EIA 603-C.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

Detailed instrumentation measurement uncertainties can be found in BACL Corp. report QAP-018.

1.7 Test Facility

The test site used by BACL Corp. to conduct and collect safety measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11, 1997 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003 & TIA/EIA-603.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: R-2463 and C-2698. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is a National Institute of Standards and Technology (NIST) accredited laboratory under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm.

2 SYSTEM TEST CONFIGURATION

2.1 Justification

The host system was configured for testing according to TIA/EIA 603-C.

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

2.2 EUT Configuration

The EUT was configured in "Loop" mode (Transmit mode) in which the EUT sends data over the satellite.

2.3 Special Accessories

NA

2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Internal Configuration Details

Manufacturer	Description	Model/ Rev.	Serial Number
Globalstar	RF Modem board	-	254-871-4019
Cornerturn, LLC	PCB Board	PCM-3353 Rev	A119A6335303
Densel-Lambda	Power supply	PWB-654D	-

2.6 Local Support Equipment List and Details

Manufacturers	Descriptions	Model No.	Serial Numbers
Anritsu	Global Star User Terminal Tester	MT8803G	MB08587

3 SUMMARY OF TEST RESULTS

Results reported relate only to the product tested.

FCC Rules	Description of Test	Results
§25.209	Antenna Performance	Note[1]
§1.1307(b)(1) & §2.1091	RF Exposure	Compliant
§2.1047 (d)	Modulation Characteristics	Note[1]
§2.1051	Spurious Emission at Antenna Terminals	Note[1]
§2.1053 & §25.202(f)	Tx Spurious Emission	Compliant
§25.202(f)	Emission Limitations (Emission Mask)	Note[1]
§2.1049	Occupied Bandwidth	Note[1]
§2.1046 & §25.204	Power Output	Note[1]
§25.204(a)	Power Limits	Note[1]
§25.216(c) &/or §25.216(f)	Emission from Mobile Earth Station for Protection of Aeronautical Radio navigation-Satellite Service (e.i.r.p. density)	Note[1]
§2.1055 & §25.202(d)	Frequency Stability/ Tolerance	Note[1]
§2.1057	Spectrum Investigated	Note[1]
§25.202(a)(4)(i)	1610 – 1626.5 MHz Authorized Frequency	Note[1]
§25.213	Protection of Radio astronomy	Note[1]

Note[1]: *Refer to the original FCC ID: J9CGSSDVM report.*

4 FCC §1.1307 (b)(1) & §2.1091 - RF Exposure

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

4.1 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

4.2 MPE Results

Maximum peak output power at antenna input terminal (dBm):	29.507
Maximum peak output power at antenna input terminal (mW):	892.69
Prediction distance (cm):	25.0
Prediction frequency (MHz):	1615.65
Maximum Antenna Gain, typical (dBi):	4.5
Maximum Antenna Gain (numeric):	2.82
Power density of prediction frequency at 25.0 cm (mW/cm^2):	0.321
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

4.3 Test Result

The power density of prediction frequency at 25 cm is 0.321 mW/cm^2 for the 4.5 dBi antenna which is compliant according to calculation under the MPE limit for uncontrolled exposure of 1.0 mW/cm^2.

5 FCC §2.1053 & §25.202 (f) – FIELD STRENGTH OF SPURIOUS RADIATION

5.1 Applicable Standard

Requirements: CFR 47, § 25.202(f). The mean power of emission shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: An amount equal to 43 dB plus 10 times the logarithm (to the base 10) of the transmitter power in watts;

In any event, when an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in paragraphs (f) (1), (2) and (3) of this section.

5.2 Measurement Procedure

The testing procedure was set according to TIA/EIA 603-C.

5.3 Test Equipment List and Details

Manufacturers	Descriptions	Model No.	Serial No.	Calibration Dates
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2010-03-24
Sunol Science Corp	Combination Antenna	JB1	A020106-1	2010-05-28
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Agilent	Pre amplifier	8447D	2944A10187	2010-03-26
A.R.A Inc	Horn antenna	DRG-1181A	1132	2009-10-27
Agilent	PSA Series Spectrum Analyzer	E4440A	MY44303352	2010-05-09
Mini-Circuit	Pre-Amp. 1GHz to 18GHz	ZVA-183-S	570400946	2010-05-10

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

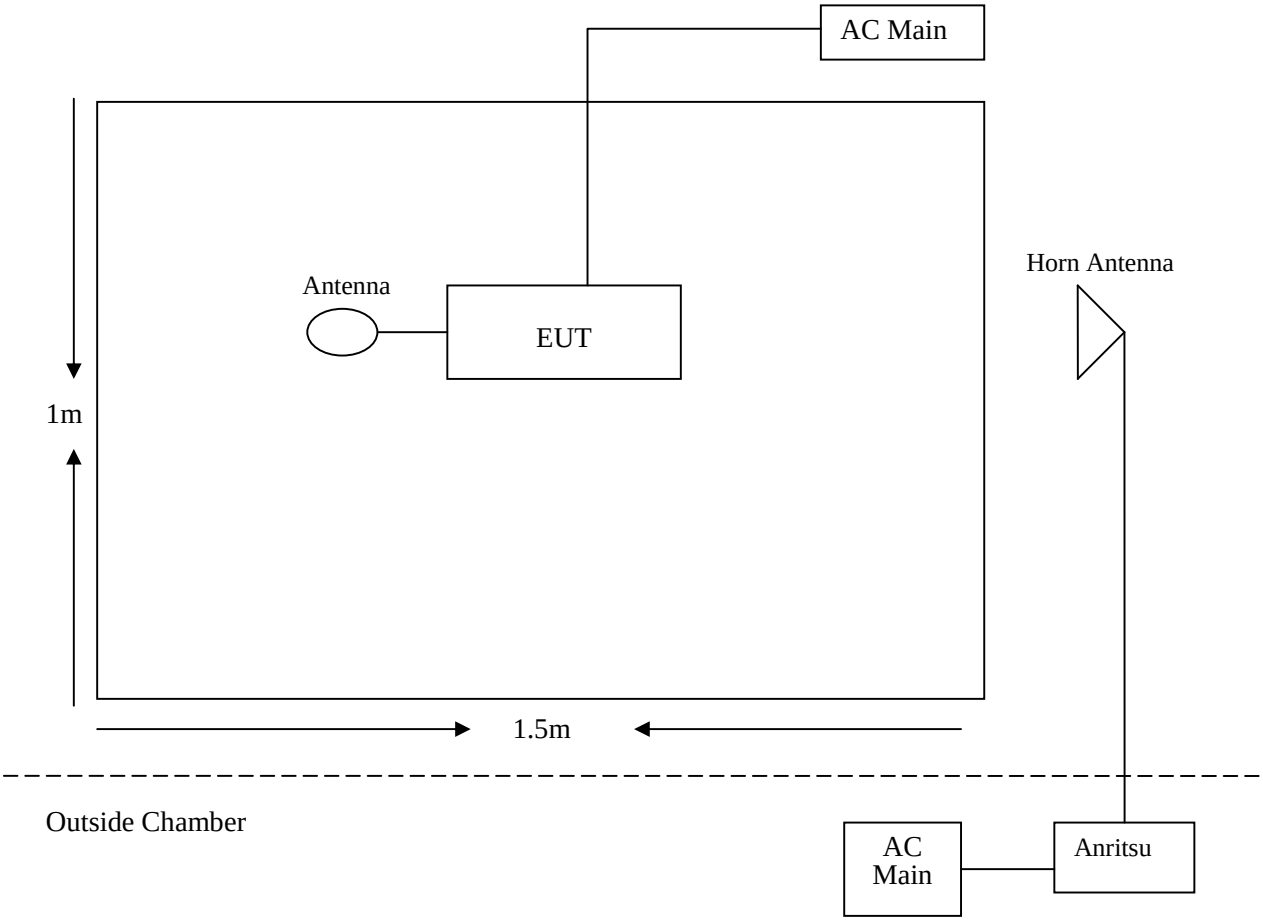
5.4 Test Environmental Conditions

Temperature:	20º C
Relative Humidity:	59%
ATM Pressure:	99kPa

Testing was performed by Dennis Huang and Kevin Li on 2010-08-09 in chamber3.

5.5 Test Setup Block Diagram

Note: EUT is 1.5m on top a non-conducting table.



5.6 Test Results Summary

According to the data in the following tables, the EUT was compliant with FCC §25.202, and had the worst margin reading(s) of:

-1.04 dB at **6462.6 MHz** in the **Vertical** Polarization.

Indicated		Azimuth (degrees)	Test Antenna		Substituted					Limit (dB)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBuV)		Height (cm)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Antenna Gain (dB)	Cable Loss (dB)	Absolute Level (dBm)		
Low Channel											
6442.92	66.53	150	148	V	6442.92	-24.62	11.4	2.34	-15.56	-13	-2.56
6442.92	65.37	278	112	H	8053.65	-25.78	11.4	2.34	-16.72	-13	-3.72
4832.19	65.29	292	103	H	4832.19	-28.59	10.5	2	-20.09	-13	-7.09
3221.46	67.62	323	138	H	3221.46	-29.01	9.4	2	-21.61	-13	-8.61
4832.19	61.59	307	190	V	4832.19	-32.29	10.5	2	-23.79	-13	-10.79
3221.46	62.94	196	100	V	3221.46	-33.48	9.4	2	-26.08	-13	-13.08
Middle Channel											
6462.6	68.05	150	170	V	6462.6	-23.1	11.4	2.34	-14.04	-13	-1.04
6462.6	67.76	335	133	H	6462.6	-23.39	11.4	2.34	-14.33	-13	-1.33
4846.95	67.14	296	162	H	4846.95	-26.74	10.5	2	-18.24	-13	-5.24
3231.3	69.2	200	100	H	3231.3	-27.43	9.4	2	-20.03	-13	-7.03
4846.95	62.67	230	109	V	4846.95	-31.21	10.5	2	-22.71	-13	-9.71
8078.25	55.21	176	100	V	8078.25	-30.3	9.7	3.34	-23.94	-13	-10.94
3231.3	64.87	227	100	V	3231.3	-31.55	9.4	2	-24.15	-13	-11.15
8078.25	52.39	356	100	H	80.78.25	-32.35	9.7	3.34	-25.99	-13	-12.99
High Channel											
6482.28	68.08	152	155	V	6482.28	-23.07	11.3	2.34	-14.11	-13	-1.11
6482.28	67.03	278	105	H	6482.28	-24.12	11.3	2.34	-15.16	-13	-2.16
4861.71	66	296	154	H	4861.71	-27.88	10.5	2	-19.38	-13	-6.38
3241.14	69.66	290	153	H	3241.14	-26.97	9.4	2	-19.57	-13	-6.57
4861.71	62.6	229	100	V	4861.71	-31.28	10.5	2	-22.78	-13	-9.78
3241.14	65.02	195	100	V	3241.14	-31.4	9.4	2	-24	-13	-11